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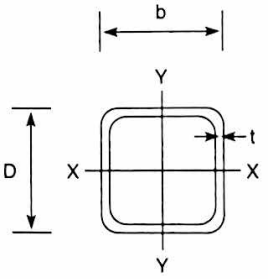
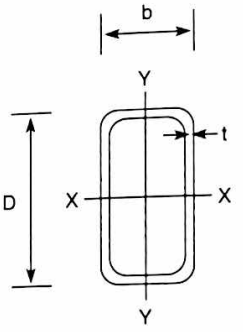


Square



Rectangular

Table 12.2.26 Properties of Square and Rectangular Tubing (TS Sections)*

Nominal Size D, in × b, in	t, in	Weight, lb/ft	Area of metal, in^2	I_{xx}, in^4	S_{xx}, in^3	r_{xx}, in	I_{yy}, in^4	S_{yy}, in^3	r_{yy}, in
TS 12 × 12	0.5	76.07	22.4	485	80.9	4.66	485	80.9	4.66
12	0.375	58.1	17.1	380	63.4	4.72	380	63.4	4.72
TS 10 × 10	0.5	62.46	18.4	271	54.2	3.84	271	54.2	3.84
10	0.375	47.9	14.1	214	42.9	3.9	214	42.9	3.9
10	0.25	32.63	9.59	151	30.1	3.96	151	30.1	3.96
TS 8 × 8	0.5	48.85	14.4	131	32.9	3.03	131	32.9	3.03
8	0.375	37.69	11.1	106	26.4	3.09	106	26.4	3.09
8	0.25	25.82	7.59	75.1	18.8	3.15	75.1	18.8	3.15
TS 6 × 6	0.5	35.24	10.4	50.5	16.8	2.21	50.5	16.8	2.21
6	0.375	27.48	8.08	41.6	13.9	2.27	41.6	13.9	2.27
6	0.25	19.02	5.59	30.3	10.1	2.33	30.3	10.1	2.33
6	0.1875	14.53	4.27	23.8	7.93	2.36	23.8	7.93	2.36
TS 5 × 5	0.5	28.43	8.36	27.0	10.8	1.80	27.0	10.8	1.80
	0.375	22.37	6.58	22.8	9.11	1.86	22.8	9.11	1.86
	0.25	15.62	4.59	16.9	6.78	1.92	16.9	6.78	1.92
	0.1875	11.97	3.52	13.4	5.36	1.95	13.4	5.36	1.95
TS 4 × 4	0.5	21.63	6.36	12.3	6.13	1.39	12.3	6.13	1.39
4	0.375	17.27	5.08	10.7	5.35	1.45	10.7	5.35	1.45
4	0.25	12.21	3.59	8.22	4.11	1.51	8.22	4.11	1.51
4	0.1875	9.42	2.77	6.59	3.3	1.54	6.59	3.3	1.54
TS 3 × 3	0.375	10.58	3.11	3.58	2.39	1.07	3.58	2.39	1.07
	0.25	8.81	2.59	3.16	2.10	1.10	3.16	2.10	1.10
	0.1875	6.87	2.02	2.60	1.73	1.13	2.60	1.73	1.13
TS 2 × 2	0.3125	6.32	1.86	0.815	0.815	0.662	0.815	0.815	0.662
2	0.25	5.41	1.59	0.766	0.766	0.694	0.766	0.766	0.694
2	0.1875	4.32	1.27	0.668	0.668	0.726	0.668	0.668	0.726
TS 20 × 12	0.5	103.3	30.4	1,650	165	7.37	750	125	4.97
12	0.375	78.52	23.1	1,280	128	7.45	583	97.2	5.03
8	0.5	89.68	26.4	1,270	127	6.94	300	75.1	3.38
8	0.375	68.31	20.1	988	98.8	7.02	236	59.1	3.43
8	0.3125	57.36	16.9	838	83.8	7.05	202	50.4	3.46
TS16 × 12	0.5	89.68	26.4	962	120	6.04	618	103	4.84
12	0.375	68.31	20.1	748	93.5	6.11	482	80.3	4.9
8	0.5	76.07	22.4	722	90.2	5.68	244	61	3.3
8	0.375	58.1	17.1	565	70.6	5.75	193	48.2	3.36
8	0.3125	48.86	14.4	481	60.1	5.79	165	41.2	3.39
TS 12 × 6	0.625	67.82	19.9	337	56.2	4.11	112	37.2	2.37
6	0.5	55.66	16.4	287	47.8	4.19	96	32	2.42
6	0.375	42.79	12.6	228	38.1	4.26	77.2	25.7	2.48
6	0.25	29.23	8.59	161	26.9	4.33	55.2	18.4	2.53
6	0.1875	22.18	6.52	124	20.7	4.37	42.8	14.3	2.56
TS 12 × 4	0.625	59.32	17.4	257	42.8	3.84	41.8	20.9	1.55
4	0.5	48.85	14.4	221	36.8	3.92	36.9	18.5	1.6
4	0.375	37.69	11.1	178	29.6	4.01	30.5	15.2	1.66
4	0.25	25.82	7.59	127	21.1	4.09	22.3	11.1	1.71
4	0.1875	19.63	5.77	98.2	16.4	4.13	17.5	8.75	1.74

* On special order, TS sections currently are available in sizes up to 30 × 30 and 30 × 24.

Table 12.2.26 Properties of Square and Rectangular Tubing (TS Sections)* (*Continued*)

Nominal Size D, in × b, in	t, in	Weight, lb/ft	Area of metal, in²	I_{xx}, in⁴	S_{xx}, in³	r_{xx}, in	I_{yy}, in⁴	S_{yy}, in³	r_{yy}, in
TS 10 × 4	0.5	42.05	12.4	136	27.1	3.31	30.8	15.4	1.58
4	0.375	32.58	9.58	110	22	3.39	25.5	12.8	1.63
4	0.25	22.42	6.59	79.3	15.9	3.47	18.8	9.39	1.69
TS 8 × 6	0.5	42.05	12.4	103	25.8	2.89	65.7	21.9	2.31
6	0.375	32.58	9.58	83.7	20.9	2.96	53.5	17.8	2.36
6	0.25	22.42	6.59	60.1	15	3.02	38.6	12.9	2.42
4	0.625	42.3	12.4	85.1	21.3	2.62	27.4	13.7	1.49
4	0.5	35.24	10.4	75.1	18.8	2.69	24.6	12.3	1.54
4	0.375	27.48	8.08	61.9	15.5	2.77	20.6	10.3	1.6
4	0.25	19.02	5.59	45.1	11.3	2.84	15.3	7.63	1.65
4	0.375	22.37	6.58	40.1	10	2.47	3.85	3.85	0.765
2	0.25	15.62	4.59	30.1	7.52	2.56	3.08	3.08	0.819
TS 6 × 4	0.5	28.43	8.36	35.3	11.8	2.06	18.4	9.21	1.48
4	0.375	22.37	6.58	29.7	9.9	2.13	15.6	7.82	1.54
4	0.25	15.62	4.59	22.1	7.36	2.19	11.7	5.87	1.6
4	0.1875	11.97	3.52	17.4	5.81	2.23	9.32	4.66	1.63
2	0.375	17.27	5.08	17.8	5.94	1.87	2.84	2.84	0.748
2	0.25	12.21	3.59	13.8	4.6	1.96	2.31	2.31	0.802
TS 4 × 3	0.25	10.51	3.09	6.45	3.23	1.45	4.1	2.74	1.15
3	0.1875	8.15	2.39	5.23	2.62	1.48	3.34	2.23	1.18
2	0.375	12.17	3.58	5.75	2.87	1.27	1.83	1.83	0.715
2	0.25	8.81	2.59	4.69	2.35	1.35	1.54	1.54	0.77
2	0.1875	6.87	2.02	3.87	1.93	1.38	1.29	1.29	0.798
TS 3 × 2	0.25	7.11	2.09	2.21	1.47	1.03	1.15	1.15	0.742
2	0.1875	5.59	1.64	1.86	1.24	1.06	0.977	0.977	0.771
2	0.125	3.9	1.15	1.38	0.92	1.1	0.733	0.733	0.8

* On special order, TS sections currently are available in sizes up to 30 × 30 and 30 × 24.

Table 12.2.27 Coefficients of Deflection for Steel Beams under Uniformly Distributed Loads

Span, ft	Fiber stress, lb/in²		Span, ft	Fiber stress, lb/in²		Span, ft	Fiber stress, lb/in²		Span, ft	Fiber stress, lb/in²	
	24,000	10,000		24,000	10,000		24,000	10,000		24,000	10,000
1	0.026	0.011	14	4.87	2.029	27	18.1	7.54	39	37.7	15.7
2	0.098	0.041	15	5.59	2.328	28	19.5	8.12	40	39.8	16.6
3	0.223	0.093	16	6.36	2.648	29	20.9	8.71	41	41.8	17.4
4	0.398	0.166	17	7.18	2.990	30	22.4	9.32	42	43.9	18.3
5	0.621	0.259	18	8.04	3.35	31	23.9	9.94	43	45.8	19.1
6	0.892	0.372	19	8.97	3.74	32	25.4	10.60	44	48.0	20.0
7	1.23	0.507	20	9.93	4.14	33	27.0	11.27	45	50.4	21.0
8	1.59	0.662	21	10.9	4.56	34	28.7	11.96	46	52.6	21.9
9	2.01	0.838	22	12.1	5.01	35	30.5	12.7	47	54.7	22.8
10	2.48	1.034	23	13.1	5.47	36	32.2	13.4	48	57.1	23.8
11	3.00	1.251	24	14.3	5.96	37	34.1	14.2	49	59.5	24.8
12	3.58	1.489	25	15.6	6.47	38	35.8	14.9	50	62.2	25.9
13	4.20	1.748	26	16.8	7.00						

NOTE: For a load concentrated at midspan, use ⅘ of the coefficient given. 1 ft = 0.305 m; 1 lb/in² = 6.89 kPa.

Table 12.2.28 Values of Standard Framed-Beam Connections

(⅞-in A325 HS bolts in standard holes,* A36 members)

AISC designation	Two angles thickness × length	Shear 1,000 lb	Bearing on beam web (t), 1,000 lb
10 rows	5/16 × 2′5½″	204	609t
9 rows	5/16 × 2′2½″	184	548t
8 rows	5/16 × 1′11½″	164	487t
7 rows	5/16 × 1′8½″	143	426t
6 rows	5/16 × 1′5½″	123	365t
5 rows	5/16 × 1′2½″	102	304t
4 rows	5/16 × 0′11½″	81.8	243t
3 rows	5/16 × 0′8½″	61.3	182t
2 rows	5/16 × 0′5½″	40.9	121t

NOTE: 1 in = 2.54 cm; 1 lb = 4.45 N.

* Values indicated are for slip-critical connections or bearing type where threads are not excluded from the shear plane. For bearing-type connections where threads are excluded from the shear plane, shear values may be increased by 1.47.

† If the web of the supporting beam is thinner than 0.17 in (0.42 in if beams frame on both sides), bearing must also be investigated.